

37. (Newly Added) A lamination ceramic chip Inductor, according to claim 34, wherein the at least one pair of insulation layers are magnetic.

38. (Newly Added) A lamination ceramic chip Inductor, according to claim 34, wherein the lamination ceramic chip inductor has a high impedance at a low resistance while comprising a small number of layers.

REMARKS

Upon entry of the present amendment, claims 8-15 and 21-38 are pending in the present application. Claim 28 is amended, and new claims 29-38 are submitted herein. A total of 26 claims are now pending in the application. The newly submitted claims 29-38 include two independent claims. Therefore, an additional fee for the newly submitted claims is included herewith.

Newly submitted claims 29-38 are supported in the claims and specification of the parent application as originally filed, and at page 26, lines 7-14 of the present specification. New claims 29 and 34 correspond to pending claims 21 and 25. New claims 30-32 and 35-37 correspond to pending claims 22-24 and 26-28. New dependent claims 33 and 38 are supported, for example, at page 52, lines 11-30 of the specification.

The amendment to claim 28 is for clarification purposes only, to correct the dependency of this claim.

No new matter is contained in any of the amended or newly submitted claims.

Rejection of Claims 8-15 and 21-28 Under 35 U.S.C. § 103(a)

Claims 8-15 and 21-28 stand rejected as obvious over Tashiro et al, U.S. Patent No. 5,515,022 in view of Hirohashi JP 6-112047. Applicants traverse this rejection for at least the following reasons.

The examiner asserted that Tashiro et al disclose the claimed invention, except for the inductor component being formed of a ceramic material, which the examiner admitted Tashiro et al fail to disclose. The examiner cited Hirohashi for its disclosure of a ceramic chip inductor. The examiner asserted that it would have been obvious to use the ceramic material of Hirohashi for the inductor of Tashiro et al, with the asserted motivation being to control the frequency response. Applicants traverse the asserted obviousness, and submit that the references contain no motivation to make the asserted combination, and the Examiners has failed to identify any source for the asserted motivation to make the asserted combination.

Tashiro et al disclose a multilayer inductor including a chip body having first, second and third magnetic material sheets 21, 22 and 23, with conductor patterns 31 and 32 sandwiched therebetween. Tashiro et al disclose that the conductor patterns 31, 32 have a width of about 50 to 300 μm and a thickness of about 5 to 50 μm . Col. 6, lines 16-18.

In the background section, Tashiro et al appear to teach away from a green sheet multilayer type of inductor, which is the type inductor disclosed by Hirohashi. See columns 1 and 2 of Tashiro et al. Specifically, Tashiro et al point out problems and disadvantages of multilayer inductors at column 1, lines 41-67. At col. 2, lines 1-53, Tashiro et al point out problems and disadvantages to the use of green sheets, as known in the prior art. Tashiro et al thereafter proceed to teach a method of using magnetic material sheets to form a multilayer inductor. Tashiro et al indicate a desire to improve high-frequency response, for example at col. 4, lines 66-67.

However, Tashiro et al do not appear to provide any motivation for using the ceramic material of Hirohashi for the inductor of Tashiro et al. The Examiner failed to identify any such motivation in Tashiro et al.

In the English abstract, Hirohashi discloses a laminated ceramic inductor, including sheets 1 printed with one-turn conductor patterns 3 connected to each other through a hole 2, and a central dummy sheet 5 consisting of 12 green sheets. The English abstract does not disclose whether sheet 1 is the same as the green sheets used to form the central dummy sheet 5 and the upper and lower dummy sheets 6 and 4, and does not disclose the thickness of these sheets. It is not clear if either sheet 1 or sheet 5 of Hirohashi corresponds to the magnetic sheet 3 of the present invention.

There is no motivation in the references to support the asserted combination, and the Examiner has failed to identify any source or explanation for the asserted motivation. In case the Examiner intends to rely on personal knowledge for this asserted motivation, Applicants respectfully request the Examiner to provide a suitable identification and documentation of the basis for such.

Applicants respectfully submit that, based on the apparent teaching in Tashiro et al away from a green sheet multilayer construction such as that of Hirohashi, and on the lack of motivation in the references for the asserted combination, a person of skill in the art with the disclosure of Tashiro et al in hand would not look to Hirohashi for potential improvements, and so would not be motivated to replace the magnetic material of Tashiro et al with a ceramic material.

Furthermore, there would be no expectation of success in making such a combination based on the apparent teaching away from green sheet constructions in Tashiro et al.

With respect to claims 21-28, the rejection did not address the "no specific gap" feature of these claims. None of the cited references appear to teach this feature.

Applicants submit that Hirohashi discloses that no gap is formed between coils and is completely silent as to whether no gap is formed between the conductive pattern of a coil and a pair of magnetic sheets. However, since Hirohashi uses printing to form the conductive pattern, then a gap would be formed between the conductive pattern of the coil and the magnetic sheets. Similarly, Tashiro et al uses printing to form the conductive patterns, so also would be expected to form a gap.

Thus, the lamination ceramic chip inductor of claims 21-28, and of claims 29-38, would not have been obvious over the asserted combination of references, since neither Tashiro et al nor Hirohashi would form an inductor comprising at least one conductive pattern formed between at least one pair of insulation layers so as to have no specific gap between the at least one conductive pattern and the at least one pair of insulation layers, as recited in these claims.

Further, neither Tashiro et al nor Hirohashi teach or suggest forming the conductive pattern by an electroforming process using a photoresist as recited in claims 25-28 and 34-38.

Furthermore, neither Tashiro et al nor Hirohashi teach or suggest the advantageous feature of the laminated ceramic chip inductor of the present invention having a high impedance at a low resistance with a small number of layers as recited in new claims 33 and 38. The background section of the specification indicates that this feature is lacking from the prior art conventional chip inductors and, at page 52, lines 11-30, the specification discloses that this feature is achieved by electroforming rather than printing, as is done in both Tashiro et al and Hirohashi. Accordingly, claims 33 and 38 further distinguish over the cited combination of references.

For the foregoing reasons, Applicants respectfully submit that the presently pending claims patentably distinguish over the cited combination of references. The Examiner is respectfully requested to reconsider and withdraw the rejection of Applicants' claims.

Objection to Drawings

In the Office action, the Examiner requested that Figure 14 be amended by designating it as prior art. Applicants submit herewith a proposed amended Fig. 14, amended to include the legend "PRIOR ART". Upon allowance of the claims, a formal drawing of Fig. 14 will be submitted, including this legend.

Conclusion

Should the Examiner consider that a telephone interview would be helpful to facilitate favorable prosecution of the above-identified application, the Examiner is invited to contact the undersigned at the telephone number provided below. If any additional fees are required for the filing of these papers, Applicants request the Commissioner to charge those fees to deposit account #18-0988, docket no. YAMAP0347USB.

Respectfully submitted,
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Date: August 21, 2001

By



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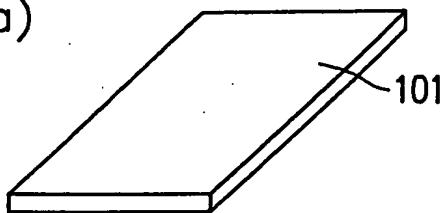
APPENDIX

The claim shown above in clean form have been amended as follows:

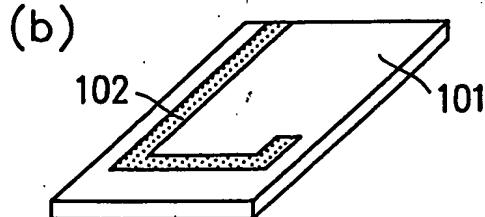
28. (Amended) A lamination ceramic chip inductor, according to claim [21] 25, wherein the at least one pair of insulation layers are magnetic.

FIG.14

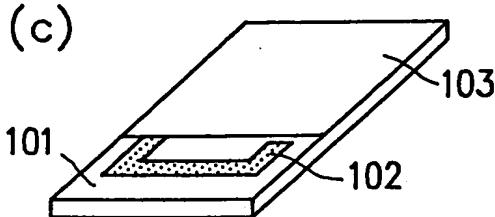
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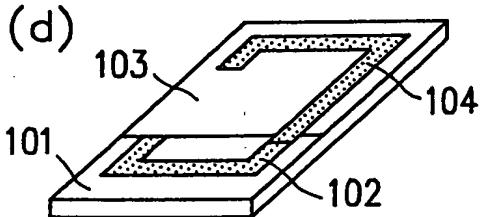
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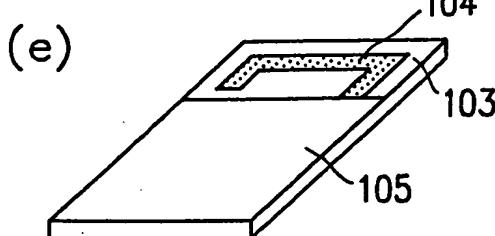
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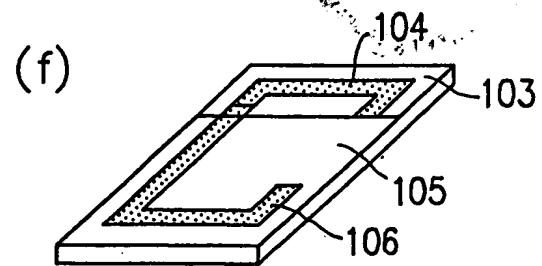
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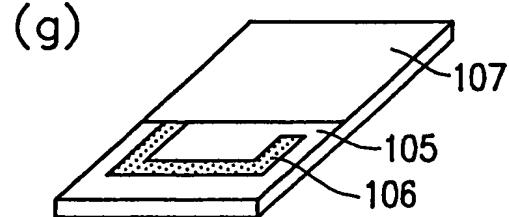
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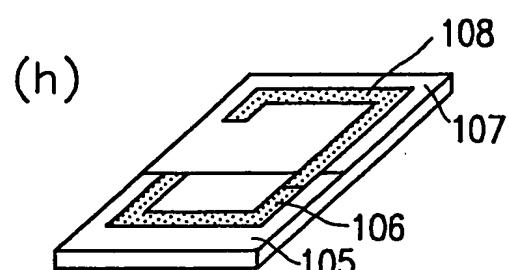
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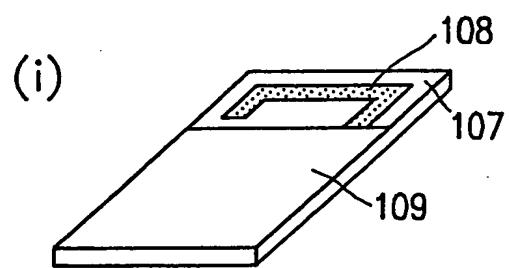
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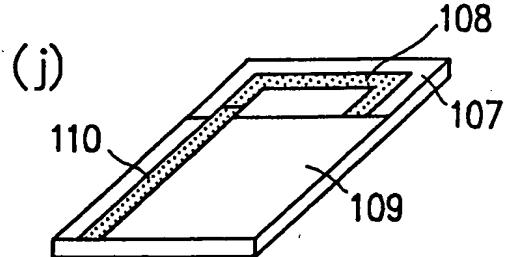
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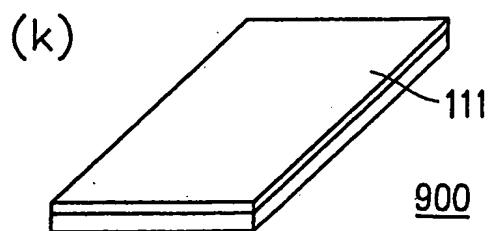
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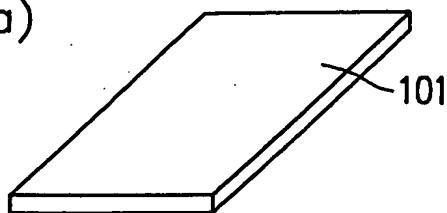
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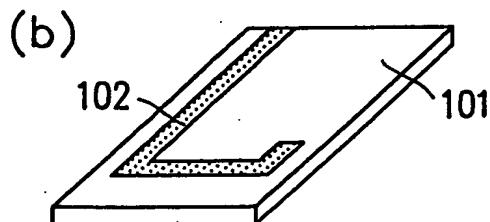
PRIOR ART

FIG.14

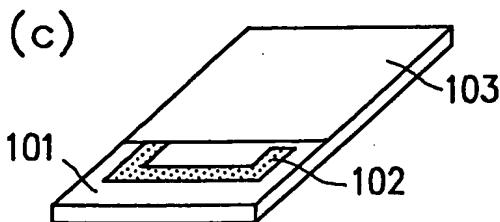
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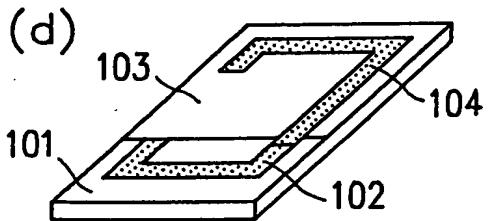
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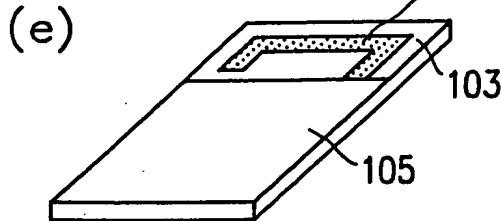
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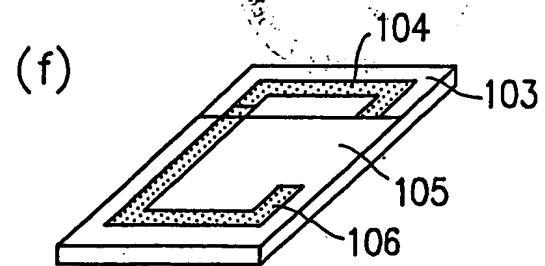
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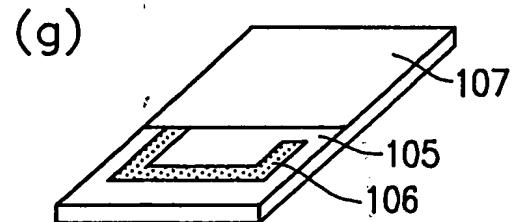
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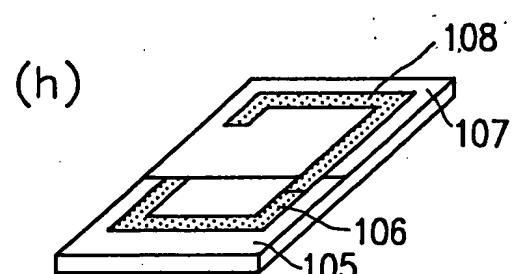
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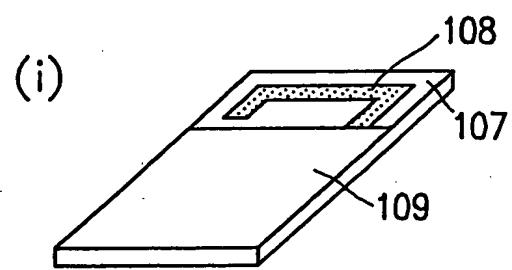
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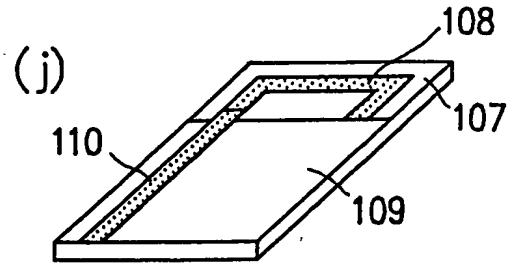
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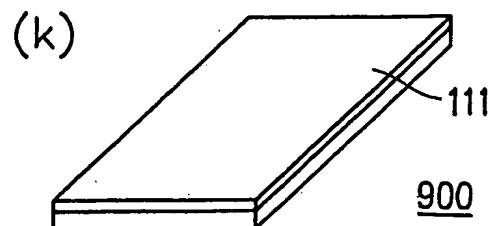
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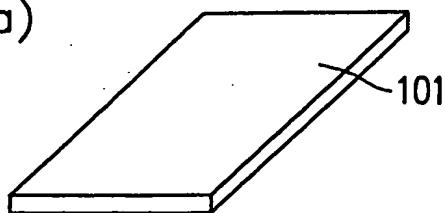
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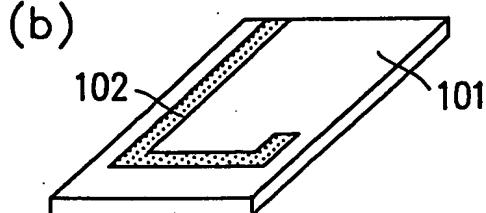
PRIOR ART

FIG.14

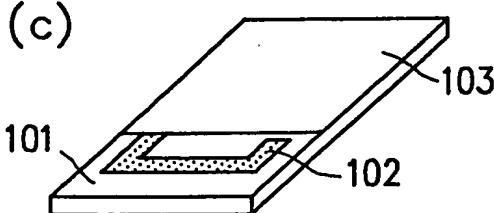
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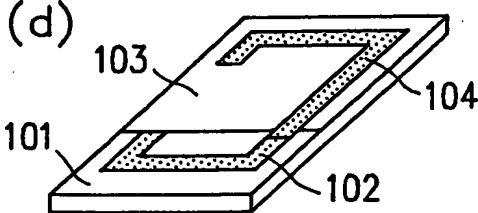
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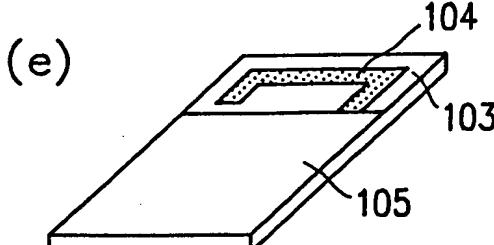
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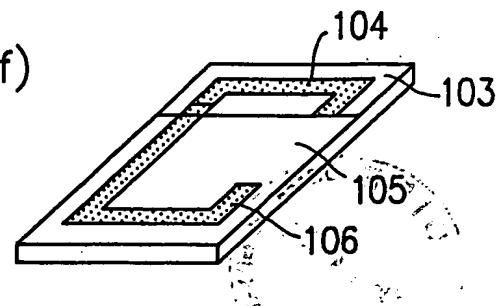
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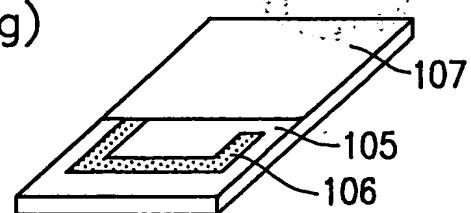
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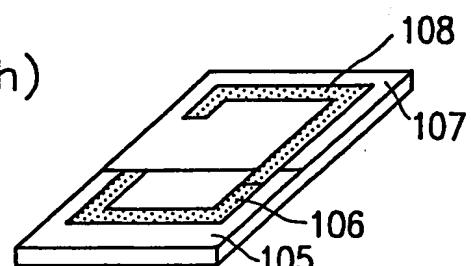
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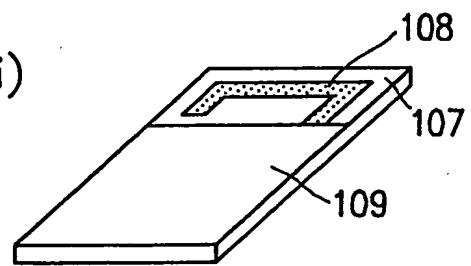
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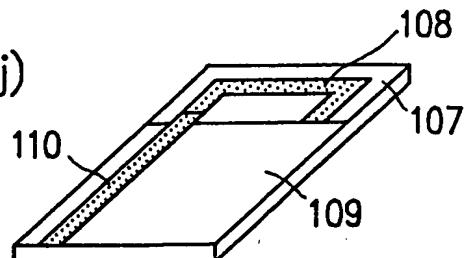
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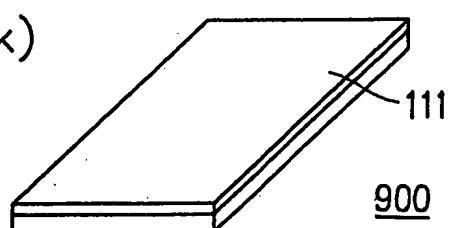
(i)



(j)



(k)



PRIOR ART

900